LONGEST PREFIX MATCH (LPM) ALGORITHM IMPLEMENTATION FOR A NETWORK PROCESSOR

ABSTRACT

Novel data structures, methods and apparatus for finding the longest prefix match search when searching tables with variable length patterns or prefixes. To find the exact match or the best matching prefix, patterns have to be compared a bit at a time until the exact or first match is found. This requires "n" number of comparisons or memory accesses to identify the closest matching pattern. The trees are built in such a way that the matching result is guaranteed to be a best match, whether it is an exact match or a longest prefix match. Using the trail of all the birds and associated prefix lengths enables determination of the correct prefix result from the trail. By construction, the search tree provides the best matching prefix at or after the first compare during walking of the trail or tree.